

*REMARKS/ARGUMENTS**The Pending Claims*

Claims 1-18 are currently pending. Claims 1-13 are directed to semi crystalline, melt processible, partially aromatic copolyamides. Claims 14-18 are directed to a method of preparing moulded articles. Reconsideration of the pending claims is respectfully requested.

Summary of the Office Action

The Office Action rejects claims 1-5, 7, 9, and 11-18 under 35 U.S.C. § 103(a) as allegedly obvious over U.S. Patent 6,291,633 (Nakamura et al.) in combination with U.S. Patent 5,786,086 (Frihart et al.) and U.S. Patent Application Publication No. 2003/0126788 (Uang et al.). In addition, the Office Action alleges that claims 6, 8, and 10 are obvious under 35 U.S.C. § 103(a) over Nakamura et al. in combination with Frihart et al., U.S. Patent 4,680,379 ("Coquard 1"), U.S. Patent 4,826,951 ("Coquard 2"), or JP Publication 05-12584 (Drawert).

*Discussion of the Obviousness Rejections**A. Nakamura et al., Frihart et al., and Uang et al.*

Claims 1-5, 7, 9, and 11-18 allegedly are obvious over the combination of Nakamura et al., Frihart et al., and Uang et al. Nakamura et al. allegedly discloses copolyamides prepared from terephthalic acid, C₆₋₁₂ aminocarboxylic acids or lactams, C₆₋₁₂ dicarboxylic acids, and C₄₋₁₂ diamines. Nakamura et al. also allegedly discloses preparing molded articles from the copolyamide by extrusion and injection molding methods. The Office concedes that Nakamura et al. does not disclose that the copolyamide comprises dimerised fatty acid. Frihart et al. reportedly discloses copolyamides prepared from terephthalic acid, adipic acid, and C₃₆ dimerised fatty acid with a trimer content of 1-35 wt% of tribasic or higher polymeric acid (col. 5, lines 31-40). Uang et al. allegedly discloses that the mechanical properties of dimerised fatty acid-based polyamides are affected by the nature of the acid. In addition, Uang et al. discloses that the polyamides described therein have a lower degree of crystallinity compared to nylon-6,6 due to the molecular weight difference between adipic acid and dimerised fatty acids. According to the Office, one of ordinary skill in the art would

have been motivated by the disclosure of Uang et al. to use dimerised fatty acid in the copolyamide of Nakamura et al. with the expected benefit of a more regular structure and increased toughness.

Applicant traverses the rejection based on the following discussion.

According to the Office Action, Uang et al. provides evidence that the mechanical properties (e.g., low crystallinity, increased solubility) of dimerised fatty acid-based polyamide is affected by the nature of the acid (paragraph [0044] of Uang et al.). The Office uses this disclosure as motivation for combining the components of Nakamura et al. and Frihart et al. However, the Examiner ignores the fact that Uang et al. describes a different category of polyamide than that of the present invention. Uang et al. refers to polyamides being synthesized from (1) diamines and (2) “relatively high molecular weight polybasic acids or esters, including dibasic acids.” However, these “dibasic acids” are obtained from thermal polymerization of a diene acid, i.e., an unsaturated fatty acid (e.g., linoleic acid). Thus in this reference, a diamine is reacted with an unsaturated fatty acid, thus forming the substance referred to as a “polyamide” as described by Uang et al.

In contrast, the polyamide of the pending claims is derived from at least three compounds, namely (a) terephthalic acid, (b) a dimerised fatty acid, and (c) a diamine, resulting at least in a terpolyamide, which is chemically different than the polyamide described by Uang et al. Furthermore, terephthalic acid cannot be considered as a “relatively high molecular weight polybasic acid,” as required by Uang et al. (paragraph [0044]). Thus, the polyamide of the present invention structurally differs from the polyamide of Uang et al.

The differences are even more apparent when one considers that the pending claims recite a lower limit of a melting point that is significantly higher than described by Uang et al. In the examples of preparing the compositions disclosed by Uang et al., the compounds are poured into a mold at temperatures below 100 °C, which indicates the low melting point of these polyamides. The present application demonstrates that although dimerised fatty acids are part of the inventive copolyamide, the melting point is not lowered or mechanical properties negatively impacted.

Thus, given the structural differences between the polyamide of the present invention and that of Uang et al., it would be inappropriate to apply Uang et al.'s observations of dimerised fatty acids to the polyamide of the pending claims. In other words, it cannot be said that one of ordinary skill in the art would appreciate any benefits from using a fatty acid as a component of a polyamide based on Uang et al., since it refers to a structurally different polyamide.

Moreover, the impact of the fatty acids on the polyamides described in Uang et al. contradicts the object of the present invention, which namely is to provide copolyamides with increased toughness. The incorporation of fatty acids in the polyamides described by Uang et al. provides a polyamide with a low crystallinity, and therefore, low rigidity or toughness. The resulting polyamide of Uang et al. is useful for soft materials, such as candles (paragraph [0007]). Thus, upon reading Uang et al., one of ordinary skill in the art would be led away from using fatty acids for the production of polyamides with increased toughness since Uang et al. teaches preparing polyamides with low rigidity or toughness.

Frihart et al. discloses a type of functionalized polyamide, namely acrylate-modified aminoamides, which also differ structurally from the polyamide of the pending claims and from the polyamide disclosed by Uang et al. These aminoamides are described as "curable" (e.g., col. 4 lines 12-17 and claim 1) because they contain one or more acrylate or methacrylate groups. Thus, the polyamide described by Frihart et al. is structurally different than the polyamide of the pending claims. Furthermore, the aminoamides described by Frihart et al. exhibit lower softening points (e.g., melting points) than the polyamides of the present invention, as defined by the pending claims (see, e.g., col. 5, lines 18-23).

Most importantly, however, is the fact that the incorporation of dimeric fatty acids imparts different effects than described in Uang et al. According to Frihart et al., the dimeric fatty acids provide improvement in the polyamide's color and oxidative stability (col. 5, lines 47-49). Frihart et al. does not disclose the effects described by Uang et al., namely the fatty acids' influence on the mechanical properties of the polyamide. Enhancement of toughness or rigidity is not mentioned in the disclosure of Frihart et al. This evidences the fact that one of ordinary skill in the art would *not* be motivated to combine the teachings of Nakamura et

al., Frihart et al., and Uang et al. because of (1) the difference in types of polyamides disclosed and (2) the difference in observed benefits of incorporating a dimerised fatty acid.

Even if, for the sake of argument, one overlooked the fact that Nakamura et al., Frihart et al., and Uang et al. are directed to different types of polyamides from one another, since Frihart et al. and Uang et al. teach differing benefits from the fatty acids, one of ordinary skill in the art would not have an expectation of success, given the disparity of teachings. The different effects that the fatty acids confer to the resulting polyamide in Frihart et al. and Uang et al. clearly demonstrate that the incorporation of dimeric fatty acids into polyamides has differing impacts that are strongly dependent on the nature of the polyamide and its components. This points to the unobviousness of the copolyamide of the pending claims.

In view of the foregoing, Applicant submits that the present invention, as defined by the pending claims, is not obvious in view of the combination of Nakamura et al. Frihart et al., and Uang et al. Applicant respectfully requests withdrawal of this rejection.

B. Nakamura et al., Frihart et al., Coquard 1, Coquard 2 and Drawert

The Office Action asserts that claims 6, 8, and 10 allegedly are obvious in view of the combination of Nakamura et al., Frihart et al., Coquard 1, Coquard 2, and Drawert. The Office Action takes the position that, in addition to the disclosures of Nakamura et al. and Frihart et al. discussed above, Coquard 1, Coquard 2, and Drawert disclose a mixture of isophthalic and terephthalic acids in the polyamides described therein.

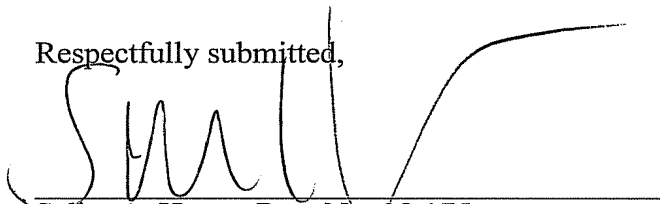
Claims 6, 8, and 10 are dependent on claim 1. As discussed above, independent claim 1 is not obvious based on the combination of Nakamura et al., Frihart et al., and Uang et al. In view of Frihart et al. and Uang et al., one of ordinary skill in the art would not be motivated to incorporate dimerised fatty acids into the polyamide of Nakamura et al., since Frihart et al. and Uang et al. demonstrate that the addition of fatty acids weaken the polyamide, thereby resulting in polyamide compositions with lower toughness. Coquard 1, Coquard 2, and Drawert do not remedy this teaching away by Frihart et al. and Uang et al. Specifically, neither Coquard 1, Coquard 2, nor Drawert teach or suggest adding dimerised fatty acids to increase toughness of a polyamide composition.

Therefore, since there is no motivation to combine the references in such a way to arrive at the present composition, claims 6, 8, and 10 are not obvious in view of the cited references. Applicant respectfully requests that this rejection be withdrawn.

Conclusion

Applicants respectfully submit that the patent application is in condition for allowance. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'S. Hasan', is written over a horizontal line.

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Date: November 8, 2007